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International application No.

PCT/US04/01793

# INTERNATIONAL SEARCH REPORT

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B26D 1/04; B24B 1/00  
US CL : 83/835,837,656,447.2,663

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 83/835,837,656,447.2,663; 451/20,57,58,69,70,71,125,178,241,244,411,412,541; 125/15,13.1,14

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
East Search

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.          |
|------------|--|--------------------------------|
| Y          | US 6,012,977 A (YOSHIKAWA et al.) 11 January 2000 (11. 01. 2000), column 1, lines 10-64 and column 3, lines 41-67.                         | 1-5, 7-10, and 12-16           |
| —          |  |                                |
| Y          |  | 2, 3, 5, 9, 10, 14, 15, and 16 |
| Y          | US 5,951,378 A (MILLER et al.) 14 September 1999 (14. 09. 1999), column 5, lines 29-67 and column 7, lines 14-67 and column 8, lines 1-43. | 2, 3, 5, 9, 10, 14, 15, and 16 |
| Y          | US 6,354,909 B1 (BOUCHER et al.) 12 March 2002 (12. 03. 2002), column 1, lines 62-67 and column 2, lines 1-10.                             | 2, 3, 5, 9, 10, 14, 15, and 16 |
| A          | US 5,471,970 A (SAKARCAN) 5 December 1995 (05. 12. 1995); Figure 3 and column 4, lines 9-50.   | 1-16                           |
| A          | US 4,576,139 A (COGSWELL) 18 March 1986 (18. 03. 1986), Figures 1 and 2.   | 1-16                           |
| A          | US 5,351,444 A (STEERE, Jr.), 4 October 1994 (04. 10. 1994), Figures 1-3.  | 1-16                           |
| A          | US 3,556,074 A (NELKE) 19 January 1971 (19. 01. 1971), column 3, lines 20-52.  | 1-16                           |
| A          | US 5,495,844 A (KITAJIMA et al.) 5 March 1996 (05. 03. 1996), column 2, lines 16-58.   | 1-16                           |

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

04 August 2004 (04.08.2004)

Date of mailing of the international search report

25 AUG 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Allan Shoab

Telephone No. (703)308-1148

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## C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages                                | Relevant to claim No. |
|------------|---|-----------------------|
| A, P       | US 6,517,427 B1 (YOSHIKAWA et al.) 11 February 2003 (11. 02. 2003), column 2, lines 49-65 and col. 3, lines 1-55. | 1-16                  |
| A          | US 6,632,126 B1 (COGSWELL) 14 October 2003 (14. 10. 2003), Figures 1-3.   | 1-6                   |